




Effect of interlayer particles on the bonding improvement of aluminum laminated composites

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Abstract

Aluminum-based composites (AMMCs) have become a popular topic in industrial progress. The aluminum (Al) structure is such that, while it is very light, it also has significant strength. This capability has increased the use of Al in various industries, especially the aerospace and marine industries, even more. Other properties of Al include the favorable plasticity of these structures. It is worth mentioning that many methods can be used to produce Al metal matrix composite (AMMC). One of these methods is Accumulated Press Bonding (APB). APB is one of the most powerful processes as a solid welding method for making MMCs. This method can be called a complex technology that has many advantages. One of the main advantages of this method is that it has a high potential to refine the nanstructures that make up a composite, making it possible to design, produce and refine composites consisting of several layers. In addition to advantages, this process also has disadvantages. Actually, in this process, the bond strength (BS) is weak. This study uses Sn particles to improve the BS of Al laminates as filler metal. So, AA1060 bars with different wt% of Sn particles (interlayer filler material) were manufactured at various pressing temperatures(Temp's) and APB steps. The peeling test was used to evaluate the bonding strength. It was found that the pressing Temp increased APB number of steps and Sn wt%, popular bonds with upper strength were shaped. Also, to illustrate the peeling surface of AA1060/Sn samples, scanning electron microscope (SEM) was used.